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(1) The alleged great or indeed any superiority in accuracy of the micrometric method over the method of transits does not exist.
(2) The two methods give results of about equal accuracy.
(3) The times of transit derived from either method are subject to an average mean error of $\pm 2^{M}{\cdot}0$, but in the case of very prominent and definite spots, such as the red spot in the years 1879–82, the mean error may be reduced to $\pm 1^{M}{\cdot}5$ or even less. On the other hand, it often largely exceeds $2^{M}{\cdot}0$, especially in the case of faint or irregular markings.

18. As the rotation of *Saturn* is performed in nearly the same time as that of *Jupiter*, it is evident that the first two conclusions apply with equal force to the former planet; so that the statement made in the *Monthly Notices*, vol. lxiv. 122, as to the great superiority of the micrometric method for determining the positions of spots on *Saturn* does not appear to be justified.

*Hove:* 1904 *February* 12.

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## *Positions and Photographic Magnitudes of ninety Stars surrounding the Variable R Cygni.* By Joel H. Metcalf, Ph.D.

(*Communicated by Professor H. H. Turner.*)

1. The suggestion that such work as the following might have value came from the recent experience of the Oxford Observatory in the work on the Rousdon variable stars. Existing positions for the comparison stars are usually given only roughly, and sometimes there is a doubt about identification in consequence. It was therefore felt that accurate places would be desirable. In this particular case it will be seen that the places good enough for a working chart at Rousdon were sometimes 5′ in error.

2. There would also seem to be good general reasons for accurate surveys of special regions, especially those that were previously known to contain objects of interest. On this account the region of variables is sure to be under close observation, and a detailed study of them will be given which it will not be possible to extend to the whole sky.

3. The photographic plate, which is the basis of the following catalogue, was taken at the University Observatory with the 13-inch astrographic telescope on the night of 1903 November 15. The plate was exposed from $1^{h}\ 8^{m}\ 50^{s}{\cdot}0$ to $2^{h}\ 9^{m}$ local sidereal time. As a few seconds of time were lost in the middle of the exposure the time was approximately one hour. The plate is a good one and shows stars of about the 14th magnitude, as one

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would judge by comparison with stars of known brightness. The variable itself has a diameter of 614, or 18″·42, which from the formulæ which were used would give a magnitude of $M_1$ 7·4 and $M_2$ 7·8 respectively.

The centre of the plate adopted was R.A. $19^h$ $32^m$ $56^s$, D. +49° 52′ 30″·0, which is approximately the position of the variable. It was measured in the following weeks by myself in the direct and reverse positions, as is the custom in the work on the astrographic chart, with the ordinary micrometer of the observatory, with the réseau and divided scale in the eye-piece.

4. To obtain the constants of the plate twelve stars were selected from the A.G. Catalogues of Bonn and Harvard, which were distributed in four groups of three each as near as possible to the edge of the plate. To Bonn 13117 the proper motion given in the catalogue was applied. To the others none was applied.

For these twelve stars standard coordinates were calculated in units of 5′ = 1 réseau interval for epoch 1855, referred to plate centre $19^h$ $32^m$ $56^s{\cdot}0$ + 49° 52′ 30″·0.

TABLE I.

| Star. | Standard Coords. $x+13{\cdot}0000$. | $y+13{\cdot}0000$. | $\Delta x_1$. | $\Delta y_1$. | $\Delta x_2$. | $\Delta y_2$. |
|---|---|---|---|---|---|---|
| East | | | | | | |
| B 13316 | 24·1407 | 10·1577 | −·3867 | +1·1613 | +·0016 | −·0030 |
| B 13323 | 24·4883 | 14·8213 | −·4503 | +1·1632 | +·0009 | −·0005 |
| H 6152 | 22·9616 | 18·3597 | −·4966 | +1·1448 | +·0008 | +·0022 |
| West | | | | | | |
| B 13102 | 2·4846 | 14·5730 | −·4276 | + ·8925 | +·0019 | +·0005 |
| B 13101 | 2·4267 | 16·0430 | −·4447 | + ·8870 | +·0046 | −·0030 |
| B 13117 | 3·8283 | 12·9422 | −·4118 | + ·9103 | −·0027 | +·0003 |
| North | | | | | | |
| H 6095 | 9·9691 | 25·2356 | −·5826 | + ·9779 | −·0037 | +·0025 |
| H 6116 | 15·8947 | 24·1169 | −·5687 | +1·0466 | ·0000 | −·0033 |
| H 6129 | 18·2566 | 24·1675 | −·5716 | +1.0820 | −·0004 | +·0026 |
| South | | | | | | |
| B 13230 | 14·9414 | 1·9205 | −·2669 | +1·0655 | +·0035 | +·0078 |
| B 13228 | 14·6251 | 2·5349 | −·2831 | +1·0476 | −·0048 | −·0052 |
| B 13244 | 17·1651 | 4·5080 | −·3091 | +1·0820 | −·0023 | −·0007 |

Under $\Delta x_1$, $\Delta y_1$ are given the differences directly obtained from the measures. From these the formulæ for correction were found to be

$$\Delta x_1 = -{\cdot}00066x - {\cdot}01343y - 0{\cdot}2208$$

$$\Delta y_1 = +{\cdot}01243x - {\cdot}00070y + 0{\cdot}8772$$

Applying these corrections to the differences, we obtain the residuals shown as $\Delta x_2$ and $\Delta y_2$.

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5. Applying these constants of reduction to the stars measured, and afterwards reducing the standard coordinates to R.A. and Decl., we obtain the results shown in Table II.

Columns 2 and 3 refer to Father Hagen's Atlas of Variable Stars, and

Columns 4 and 5 to the *Memoirs R.A.S.* Vol. LV. p. xxxiii (now in the press). The magnitudes were formed by adding to the "Adopted Mag." the adopted correction given in the last column whenever available. The rough places there given are sometimes as much as 5′ in error, as already remarked in § 1; but it is hoped that the stars have been correctly identified.

In column 6 is given the diameter of the star disc on the photograph measured in units of 0″·03 (or 0·0001 réseau intervals).

In columns 7 and 8 magnitudes are deduced from these diameters from two formulæ hereafter to be explained.

TABLE II.

*Stars near R Cygni.*

| Ref. No. | Hagen | | Rousdon | | Photographic Diameter. | $M_1$. | $M_2$. | Coordinates, Epoch 1855·0. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Standard | | R.A. 19h + | | N. Decl. 49° + | |
| | No. | Mag. | No. | Mag. | | | | X. | Y. | m | s | ′ | ″ |
| 1 | ... | ... | 8 | 9·8 | 347 | 10·5 | 10·3 | −5·921 | −0·074 | 29 | 52·29 | 51 | 58·7 |
| 2 | 19 | 9·5 | ... | ... | 469 | 9·1 | 9·0 | −4·633 | +4·995 | 30 | 30·97 | 77 | 22·9 |
| 3 | ... | ... | 15 | 11·0 | 170 | 12·5 | 13·4 | −4·554 | +1·263 | 30 | 34·36 | 58 | 43·5 |
| 4 | 20 | 9·6 | ... | ... | 398 | 9·9 | 9·7 | −4·297 | −2·580 | 30 | 43·25 | 39 | 31·2 |
| 5 | 5 | 8·6 | 3 | 8·8 | 500 | 8·7 | 8·7 | −4·137 | +1·240 | 30 | 47·34 | 58 | 37·6 |
| 6 | 24 | 9·8 | ... | ... | 439 | 9·4 | 9·3 | −3·688 | −3·225 | 31 | 2·18 | 36 | 19·0 |
| 7 | 4 | 8·4 | 4 | 8·5 | 644 | 7·0 | 7·6 | −3·233 | +5·176 | 31 | 14·77 | 78 | 20·0 |
| 8 | 40 | 11·3 | ... | ... | 295 | 11·1 | 11·0 | −2·747 | +0·812 | 31 | 30·63 | 56 | 31·7 |
| 9 | 42 | 11·4 | ... | ... | 297 | 11·1 | 11·0 | −2·734 | +1·848 | 31 | 30·87 | 61 | 42·5 |
| 10 | 37 | 10·9 | ... | ... | 349 | 10·5 | 10·3 | −2·601 | −0·945 | 31 | 35·41 | 47 | 44·8 |
| 11 | 58 | 12·4 | ... | ... | 2[illegible]6 | 11·7 | 12·2 | −2·357 | +1·747 | 31 | 42·63 | 61 | 12·7 |
| 12 | 12 | 9·1 | ... | ... | 424 | 9·6 | 9·4 | −2·363 | −5·366 | 31 | 43·34 | 25 | 38·8 |
| 13 | 25 | 9·8 | ... | ... | 484 | 8·9 | 8·9 | −2·332 | −1·830 | 31 | 43·86 | 43 | 19·6 |
| 14 | 47 | 11·7 | ... | ... | 236 | 11·8 | 12·0 | −2·288 | +1·840 | 31 | 44·77 | 61 | 40·7 |
| 15 | 61 | 12·5 | ... | ... | 140 | 12·9 | 14·2 | −2·177 | +2·820 | 31 | 48·11 | 66 | 34·8 |
| 16 | 44 | 11·5 | ... | ... | 295 | 11·1 | 11·0 | −2·177 | −1·253 | 31 | 48·59 | 46 | 12·9 |
| 17 | 48 | 11·7 | ... | ... | 220 | 12·0 | 12·3 | −2·029 | −0·141 | 31 | 53·06 | 51 | 46·7 |
| 18 | 28 | 10·0 | ... | ... | 407 | 9·8 | 9·6 | −1·988 | −2·217 | 31 | 54·54 | 41 | 23·9 |
| 19 | 57 | 12·2 | ... | ... | 220 | 12·0 | 12·3 | −1·783 | +2·597 | 32 | 0·42 | 65 | 28·3 |
| 20 | ... | ... | 14 | 11·5 | 204 | 12·1 | 12·6 | −1·759 | −0·135 | 32 | 1·44 | 51 | 48·7 |
| 21 | 18 | 9·5 | ... | ... | 408 | 9·8 | 9·7 | −1·760 | −3·560 | 32 | 1·71 | 34 | 41·2 |
| 22 | 53 | 11·9 | ... | ... | 181 | 12·4 | 13·1 | −1·738 | +2·209 | 32 | 1·86 | 63 | 31·9 |

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| Ref. No. | Hagen | | Rousdon | | Photographic Diameter. | $M_1$. | $M_2$. | Coordinates, Epoch 1855·0. | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | No. | Mag. | No. | Mag. | | | | Standard | | R.A. $19^h$+ | | N. Decl. 49°+ | |
| | | | | | | | | X. | Y. | m | s | ′ | ″ |
| 23 | 7 | 8·9 | ... | ... | 520 | 8·5 | 8·5 | −1·740 | −6·074 | 32 | 2·56 | 22 | 7·0 |
| 24 | 2 | 7·0 | 2 | 7·4 | 800 | 5·2 | 6·7 | −1·711 | +0·488 | 32 | 2·86 | 54 | 55·7 |
| 25 | 22 | 9·7 | ... | ... | 395 | 9·9 | 9·7 | −1·530 | +5·263 | 32 | 8·09 | 78 | 48·3 |
| 26 | 17 | 9·4 | ... | ... | 394 | 9·9 | 9·7 | −1·465 | −4·173 | 32 | 10·86 | 31 | 37·6 |
| 27 | 51 | 11·9 | 13 | 11·5 | 220 | 12·0 | 12·3 | −1·443 | −0·809 | 32 | 11·28 | 48 | 26·8 |
| 28 | 38 | 11·1 | ... | ... | 326 | 10·8 | 10·6 | −1·419 | +1·418 | 32 | 11·87 | 59 | 34·9 |
| 29 | 50 | 11·8 | ... | ... | 246 | 11·7 | 11·8 | −1·369 | −0·112 | 32 | 13·52 | 51 | 55·9 |
| 30 | ... | ... | ... | ... | 164 | 12·6 | 13·6 | −1·287 | −0·225 | 32 | 16·08 | 51 | 22·1 |
| 31 | 34 | 10·7 | ... | ... | 287 | 11·2 | 11·1 | −1·248 | +2·711 | 32 | 17·09 | 66 | 2·9 |
| 32 | ... | ... | ... | ... | 136 | 13·0 | 14·4 | −1·141 | −0·035 | 32 | 20·59 | 52 | 19·2 |
| 33 | ... | ... | ... | ... | 100 | 13·3 | 15·7 | −1·126 | +0·170 | 32 | 20·96 | 53 | 20·7 |
| 34 | 10 | 9·0 | ... | ... | 465 | 9·1 | 9·0 | −1·096 | −4·489 | 32 | 22·24 | 30 | 3·0 |
| 35 | ... | ... | ... | ... | 100 | 13·3 | 15·7 | −1·076 | −0·769 | 32 | 22·65 | 48 | 39·0 |
| 36 | ... | ... | ... | ... | 100 | 13·3 | 15·7 | −1·043 | +0·848 | 32 | 23·58 | 56 | 44·1 |
| 37 | ... | ... | ... | ... | 100 | 13·3 | 15·7 | −0·983 | +0·635 | 32 | 25·46 | 55 | 40·3 |
| 38 | ... | ... | ... | ... | 100 | 13·3 | 15·7 | −0·858 | −0·769 | 32 | 29·41 | 48 | 39·1 |
| 39 | ... | ... | ... | ... | 240 | 11·8 | 11·9 | −0·744 | +0·038 | 32 | 32·91 | 52 | 41·3 |
| 40 | 1 | 4·9 | 1 | 6·4 | 1440 | −2·2 | 4·1 | −0·734 | +0·182 | 32 | 33·22 | 53 | 24·5 |
| 41 | ... | ... | ... | ... | 150 | 12·8 | 13·9 | −0·724 | −0·189 | 32 | 33·55 | 51 | 33·2 |
| 42 | 55 | 12·1 | ... | ... | 248 | 11·7 | 11·8 | −0·590 | +1·251 | 32 | 37·65 | 58 | 45·2 |
| 43 | 60 | 12·5 | ... | ... | 141 | 12·9 | 14·2 | −0·584 | −0·544 | 32 | 37·89 | 49 | 46·7 |
| 44 | ... | ... | 17 | 12·5 | 215 | 12·0 | 12·4 | −0·560 | +0·408 | 32 | 38·61 | 54 | 32·3 |
| 45 | 36 | 10·8 | 11 | 10·7 | 352 | 10·5 | 10·2 | −0·507 | −1·473 | 32 | 40·30 | 45 | 8·0 |
| 46 | ... | ... | ... | ... | 120 | 13·1 | 15·0 | −0·398 | +0·179 | 32 | 43·65 | 53 | 23·7 |
| 47 | 56 | 12·2 | ... | ... | 284 | 11·2 | 11·2 | −0·296 | −0·460 | 32 | 46·82 | 50 | 12·0 |
| 48 | ... | ... | ... | ... | 100 | 13·3 | 15·7 | −0·132 | −0·182 | 32 | 51·91 | 51 | 35·4 |
| 49 | ... | ... | 16 | 13·3 | 210 | 12·1 | 12·5 | −0·121 | −0·424 | 32 | 52·25 | 50 | 22·8 |
| 50 | ... | ... | ... | ... | 100 | 13·3 | 15·7 | −0·090 | +0·098 | 32 | 53·21 | 52 | 59·4 |
| 51 | 59 | 12·4 | 12 | 11·8 | 218 | 12·0 | 12·3 | −0·047 | −0·587 | 32 | 54·54 | 49 | 33·9 |
| 52 | R Cygni | | ... | ... | 614 | 7·4 | 7·8 | −0·016 | −0·003 | 32 | 55·52 | 52 | 29·1 |
| 53 | 14 | 9·3 | 10 | 9·6 | 488 | 8·9 | 8·8 | +0·061 | +0·294 | 32 | 57·89 | 53 | 58·2 |
| 54 | ... | ... | ... | ... | 100 | 13·3 | 15·7 | +0·366 | +0·866 | 33 | 7·37 | 56 | 49·8 |
| 55 | ... | ... | ... | ... | 160 | 12·6 | 13·7 | +0·420 | +0·537 | 33 | 9·05 | 55 | 11·1 |
| 56 | ... | ... | ... | ... | 100 | 13·3 | 15·7 | +0·466 | +0·875 | 33 | 10·48 | 56 | 52·5 |
| 57 | 49 | 11·8 | ... | ... | 193 | 12·3 | 12·8 | +0·472 | −1·773 | 33 | 10·60 | 43 | 38·1 |
| 58 | 23 | 9·8 | ... | ... | 420 | 9·7 | 9·5 | +0·501 | +3·658 | 33 | 11·64 | 70 | 47·3 |
| 59 | ... | ... | ... | ... | 100 | 13·3 | 15·7 | +0·623 | −0·311 | 33 | 15·32 | 50 | 56·6 |
| 60 | ... | ... | ... | ... | 100 | 13·3 | 15·7 | +0·636 | −1·030 | 33 | 15·70 | 47 | 20·9 |

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| Ref. No. | Hagen No. | Hagen Mag. | Rousdon No. | Rousdon Mag. | Photographic Diameter. | $M_1$. | $M_2$. | Coordinates, Epoch 1855·0. Standard X. | Y. | R.A. 19h+ m | s | N. Decl. 49°+ ′ | ″ |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 61 | ... | ... | ... | ... | 100 | 13·3 | 15·7 | +0·688 | +0·913 | 33 | 17·38 | 57 | 3·8 |
| 62 | ... | ... | ... | ... | 110 | 13·2 | 15·3 | +0·743 | +0·134 | 33 | 19·06 | 53 | 10·1 |
| 63 | 27 | 10·0 | ... | ... | 395 | 9·9 | 9·7 | +0·763 | +2·579 | 33 | 19·78 | 65 | 23·6 |
| 64 | ... | ... | ... | ... | 100 | 13·3 | 15·7 | +0·838 | +0·962 | 33 | 22·06 | 57 | 18·4 |
| 65 | 35 | 10·8 | ... | ... | 327 | 10·8 | 10·6 | +0·870 | +1·356 | 33 | 23·07 | 59 | 16·6 |
| 66 | 43 | 11·4 | ... | ... | 269 | 11·4 | 11·4 | +0·909 | −1·301 | 33 | 24·16 | 45 | 59·5 |
| 67 | ... | ... | ... | ... | 200 | 12·2 | 12·7 | +0·911 | −0·135 | 33 | 24·27 | 51 | 49·3 |
| 68 | 54 | 11·9 | ... | ... | 226 | 11·9 | 12·2 | +0·956 | −2·162 | 33 | 25·56 | 41 | 41·2 |
| 69 | ... | ... | ... | ... | 100 | 13·3 | 15·7 | +0·981 | +0·449 | 33 | 26·47 | 54 | 44·5 |
| 70 | 39 | 11·2 | ... | ... | 294 | 11·1 | 11·0 | +0·985 | +1·303 | 33 | 26·64 | 59 | 0·7 |
| 71 | ... | ... | ... | ... | 110 | 13·2 | 15·3 | +1·111 | −0·191 | 33 | 30·47 | 51 | 32·4 |
| 72 | 46 | 11·7 | ... | ... | 207 | 12·1 | 12·5 | +1·186 | −2·283 | 33 | 32·66 | 41 | 4·8 |
| 73 | 52 | 11·9 | ... | ... | 203 | 12·2 | 12·7 | +1·194 | −2·579 | 33 | 32·89 | 39 | 35·9 |
| 74 | 41 | 11·4 | ... | ... | 269 | 11·4 | 11·4 | +1·209 | +1·268 | 33 | 33·60 | 58 | 50·0 |
| 75 | ... | ... | ... | ... | 190 | 13·3 | 15·7 | +1·253 | +0·705 | 33 | 34·93 | 56 | 1·1 |
| 76 | 8 | 8·9 | ... | ... | 504 | 8·7 | 8·7 | +1·288 | +4·759 | 33 | 36·30 | 76 | 17·3 |
| 77 | 31 | 10·2 | ... | ... | 413 | 9·7 | 9·5 | +1·420 | +0·563 | 33 | 40·11 | 55 | 18·4 |
| 78 | 45 | 11·6 | ... | ... | 293 | 11·1 | 11·0 | +1·489 | −0·369 | 33 | 42·18 | 50 | 38·7 |
| 79 | 32 | 10·3 | ... | ... | 323 | 10·8 | 10·6 | +1·610 | −0·214 | 33 | 45·94 | 51 | 25·1 |
| 80 | 29 | 10·0 | ... | ... | 333 | 10·7 | 10·5 | +2·001 | +1·230 | 33 | 58·23 | 58 | 38·0 |
| 81 | 30 | 10·1 | ... | ... | 355 | 10·4 | 10·2 | +2·098 | +1·908 | 34 | 1·32 | 62 | 1·3 |
| 82 | 33 | 10·5 | ... | ... | 349 | 10·5 | 10·3 | +2·473 | −0·570 | 34 | 12·67 | 49 | 37·4 |
| 83 | 11 | 9·1 | 5 | 9·2 | 424 | 9·6 | 9·4 | +2·618 | −1·383 | 34 | 17·05 | 45 | 33·4 |
| 84 | 16 | 9·4 | ... | ... | 415 | 9·7 | 8·8 | +3·013 | +3·226 | 34 | 30·03 | 68 | 35·4 |
| 85 | 6 | 8·8 | 6 | 8·8 | 418 | 9·7 | 9·5 | +3·468 | −0·002 | 34 | 43·62 | 52 | 26·3 |
| 86 | 15 | 9·3 | ... | ... | 388 | 10·0 | 9·8 | +3·440 | +5·672 | 34 | 43·81 | 80 | 48·5 |
| 87 | 13 | 9·1 | 7 | 9·1 | 407 | 9·8 | 9·6 | +4·370 | +1·510 | 35 | 11·97 | 59 | 58·0 |
| 88 | 26 | 9·9 | ... | ... | 418 | 9·7 | 9·5 | +4·930 | +3·931 | 35 | 30·04 | 72 | 2·9 |
| 89 | 21 | 9·6 | ... | ... | 352 | 10·4 | 10·2 | +5·189 | +5·351 | 35 | 38·54 | 79 | 8·2 |
| 90 | 9 | 9·0 | ... | ... | 405 | 9·8 | 9·6 | +5·655 | −2·352 | 35 | 50·78 | 40 | 36·2 |
| 91 | 3 | 8·2 | ... | ... | 648 | 7·0 | 7·6 | +8·469 | +2·034 | 37 | 19·71 | 62 | 21·5 |

6. To convert the diameters of the star images into photographic magnitudes they were first plotted against Hagen's magnitudes, and it was found that a straight line would very fairly represent the results from mag. 12·5 to 8·5, but for the brighter stars the diameters were too large.

The formula deduced was

$$\text{Magnitude} = 14{\cdot}5 - {\cdot}0116 \times \text{diameter}.$$

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The magnitudes computed by using it are given under heading 7, designated $M_1$. It will be seen that the Hagen stars Nos. 1 to 4 cannot be represented by this even approximately.

Accordingly the log (diameter) was plotted against the Hagen magnitudes, and it was found that the following straight line represented the results very nearly :—

$$\text{Magnitude} = 35{\cdot}7 - 10 \log (\text{diameter}).$$

This formula is much better for the brighter stars, but fails for the fainter ones.

It may be noticed that on transforming it to the form

$$\text{Intensity of light} \propto 10^{-0{\cdot}4 \times \text{mag.}} \propto (\text{diameter})^4$$

this formula corresponds to the supposition that the diameter increases as the fourth root of the exposure time, if we suppose exposure time exactly equivalent to increased intensity of light. This law was obtained by Pritchard, *Proc. R.S.* vol. xl., though other laws have been found by other observers—the inverse square by Rutherfurd and the inverse cube by Prof. Turner at Greenwich in 1889 (see *Monthly Notices*, xlix. p. 292).

The results from this formula are given under head $M_2$.

7. Father Hagen gave the places of his comparison stars only approximately to the nearest second of time in R.A. and the nearest 0″·1 in D, and so no comparison is printed, though one was made and sent to him. The differences between his positions and those obtained by me are often quite large. This would seem to show the need of similar work being done for the whole list of variable stars.

*Oxford University Observatory.*

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## *On the Absolute Proper Motions of Certain Double Stars showing Large Relative Motion.* By H. Furner and J. Storey.

(*Communicated by the Astronomer-Royal.*)

During Mr. Lewis' work on double stars he has found a number which show large relative motions, and it is of interest to examine the meridian observations in order to determine these absolute motions. A list of these stars was given to us, and a first instalment of our work upon them we now beg to lay before the Society.

Some 100 stars have been examined, but owing to the lack of sufficient material we have confined our present paper to such stars as show by micrometer measures a relative motion of at least 0″·1 per annum.